

AMENDMENT UNDER 37 C.F.R. § 1.116

Application No.: 10/042,154

Atty Docket No.: Q62628

**REMARKS**

The Office Action of January 16, 2004 has been received and its contents carefully considered.

Claims 1 to 20 are all the claims pending in the application, prior to the present amendment.

Applicants submit that the finality of the present invention was premature, and request its withdrawal. In particular, applicants amended claim 1 to incorporate the recitations of claims 4 and 6. Claims 4 and 6 had not been rejected over Nissan, but amended claim 1 has been rejected over Nissan. In Paragraph 16 of the Office Action, in responding to arguments that applicants previously submitted, the Examiner acknowledges that applicants have asserted that because claims 4 and 6 were not included in the rejection based on the Nissan reference, the claims as amended, which contains the recitations of claims 4 and 6, are free from the Nissan reference. The Examiner states that this argument is moot in view a new rejection based on Nissan in view of Erikson.

In essence, the Examiner has changed his position concerning the applicability of the Nissan reference to the subject matter of claims 4 and 6, as can be seen from his changed analysis of the teachings of Nissan. Applicants recognize that the Examiner is entitled to change his previous position concerning the applicability of the reference.

Applicants point out, however, that in Paragraph 20, the Examiner states that applicants' amendment necessitated the new grounds of rejection presented in the present Office Action. Applicants disagree that the amendment necessitated the new ground of rejection because the

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incorporation of claims 4 and 6 into claim 1 did not necessitate a new ground of rejection based on Nissan. The Examiner simply has changed his view. Accordingly, applicants submit that the finality of the present Office Action is premature and that the present Office Action should not have been made final. Therefore, applicants request the Examiner to withdraw the finality of the present Office Action..

Claims 1, 7 and 10-12 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over WO 99/35089 to Nissan Chemical Industries, Ltd., as evidenced by the newly cited U.S. Patent 6,080,216 to Erikson.

The Examiner refers to WO '089 as "Nissan" throughout his discussion of this rejection. Similarly, applicants will refer to this document as "Nissan".

Applicants submit that Nissan does not disclose or render obvious the presently claimed invention and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 as amended above is directed to a polishing composition comprising at least (a) water, (b) alumina crystal and (c) a sol product, wherein the sol product (c) is amorphous and is (i) a mixture as set forth in (i) or (ii) of claim 1. Thus, applicants have amended claim 1 to state that the sol product (c) is amorphous. Support for this amendment can be found in paragraph [0036] of the present specification. As disclosed in paragraph [0036], an amorphous sol is not a boehmite sol.

The amorphous sol product of the present invention is derived from an aluminum salt and is (i) a mixture of an aluminum salt with at least one species selected from the group consisting

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of sodium hydroxide, potassium ammonia, organic amine compounds, amine chelate compounds, aminocarboxylic acids, aminocarboxylic acid chelate compounds and aminophosphonic acid chelate compounds or is (ii) a mixture of at least one species selected from among hydrates and anhydrides of aluminum salts including inorganic acid aluminum salts that include aluminum sulfate, aluminum chloride, aluminum nitrate, aluminum phosphate and aluminum borate, and organic acid aluminum salts that include aluminum acetate, aluminum lactate and aluminum stearate with at least one species selected from among sodium hydroxide, potassium hydroxide, ammonia, organic amine compound, amine chelate compounds, aminocarboxylic acids, aminocarboxylic acid chelate compounds and amino-phosphonic acid chelate compounds.

Applicants have also added new dependent claim 21 that recites that the alumina crystal (b) has an average particle size of from 0.2 to 5  $\mu\text{m}$ , as disclosed in paragraph [0029] of the present specification.

The Examiner refers to Example 1 of Nissan, and especially page 16, second full paragraph, where, according to the Examiner, Nissan discloses alumina sols that employ a polishing accelerator comprising basic aluminum nitrate. The Examiner argues that this basic aluminum nitrate would have been expected to have limited solubility and would result in the formation of sol particles for at least a portion of the basic aluminum nitrate. The Examiner states that these sol products would be derived from an aluminum salt.

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In support of his position that the use of the aluminum nitrate in Nissan would be expected to form a sol product, the Examiner refers to the newly cited Erikson patent at column 13, line 60 to column 14, line 8 as evidence that the prior art recognizes that solution-based compositions or sols are made by dissolving aluminum salts, such as basic aluminum nitrate, in water. The Examiner asserts that the use of the basic aluminum nitrate in the Nissan reference would have been expected to produce at least some sol particles.

In response, applicants point out that there is no disclosure in Nissan with respect to an amorphous aluminum sol. The basic aluminum nitrate in Nissan cannot per se form an amorphous sol. In order to form an amorphous sol, alkalies such as sodium hydroxide, amine, and the like, are indispensable.

A main point of the Examiner's rejection is that the aluminum nitrate in Nissan would form a sol. Applicants disagree that the aluminum nitrate in Nissan forms a sol in Nissan. Nissan does not disclose that the aluminum nitrate in Nissan forms a sol in Nissan, but only discloses that the aluminum nitrate functions as a polishing accelerator. Further, although Erickson refers to a sol produced from an aluminum salt, the sol is not contained in the final polishing composition in Erickson, and there is no teaching in Erickson that indicates that the aluminum nitrate in Nissan would necessarily form a sol.

Comparative Example 8 of the present specification discloses an alumina powder in combination with aluminum nitrate as a polishing accelerator, and states that this Comparative Example does not contain an alumina sol derived from an aluminum salt. Applicants submit that

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Comparative Example 8 shows that the mere addition of an aluminum salt such as aluminum nitrate does not necessarily result in the formation of an alumina sol and does not achieve the results obtained by the present invention. The effects of the present invention cannot be obtained unless the sol product is contained in the final polishing composition, as described in paragraphs [0057] and [0058] of the present application.

In addition, the Examiner states that to the extent the alumina [in Nissan] is not derived from an aluminum salt, the disclosed alumina for polishing [in Nissan] is a commercial alumina sol. The Examiner argues that since alumina is  $\text{Al}_2\text{O}_3$ , and since Nissan teaches the same utility as set forth in the present specification and in the preamble, the Examiner states that the alumina sol of Nissan reads on the claimed alumina sol. The Examiner argues that the derivation of the alumina sol has not been shown to impart patentable distinction to the otherwise known materials.

In response, it is not entirely clear to applicants what portion of Nissan the Examiner is relying upon when he makes the above statements. Applicants note that Nissan discloses at pages 8 to 10 the manufacture of alumina powder (crystals) starting from an alumina sol, and Example 1 of Nissan, at page 14, starts with an aqueous alumina sol, and converts this sol to alumina powder, having a  $\delta$ -form crystal structure, which is then made into an aqueous alumina slurry. Applicants believe the Examiner may be relying on these disclosures at pages 8 to 10 and 14 of an alumina sol in Nissan to satisfy the alumina sol of the present claims.

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However, applicants point out that all of the starting alumina sol in Nissan would be converted to alumina powder, and that the final polishing composition in Nissan would not contain any of the starting alumina sol. The alumina powder that is obtained from the alumina sol in Nissan would satisfy the recitations of the present claims of an alumina crystal, but would not satisfy the recitations of the present claims of an alumina sol.

Further, the Examiner's position appears to be based on the assumption that all alumina sols are the same and will have the same properties and functions in a polishing composition, regardless of how they are made. This assumption appears to be necessary to the Examiner's position since Nissan does not disclose that the alumina sol is produced from an aluminum salt.

In response, since Nissan does not disclose the use of an alumina sol in the final polishing composition, and does not necessitate an alumina sol for the final polishing composition, applicants submit that, as a matter of course, the effects of the present invention cannot be obtained in Nissan.

The Examiner states that Nissan, at page 12, first full paragraph, discloses a polishing accelerator in an amount of 0.1 to 10% by weight. The Examiner further states that Nissan, at page 10, fifth full paragraph, discloses the concentrations of the alumina as ranging from 0.5 to 20% by weight. Applicants believe these comments are directed to claims 10 to 12.

With respect to claim 10, applicants agree that Nissan discloses a polishing accelerator in the claimed amount, but as can be seen from the above discussion, Nissan does not disclose the use of an alumina sol in combination with a polishing accelerator as in the present invention.

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With respect to claims 11 and 12, applicants submit the disclosure at page 10 of Nissan relates to the amount of alumina crystals (powder), and not to the amount of alumina sol in a polishing composition.

The Examiner argues at page 5 of the Office Action, next to last paragraph, that to the extent the Nissan compositions differ from the present claims in the derivation of the alumina sol from an aluminum salt or the characterization of the accelerator as sol particles, that applicants have not shown that a sol from an aluminum salt imparts a patentable distinction to the composition, since Nissan employs the same components [polishing accelerator and alumina] having overlap in concentrations and to be used for the same utility, that is, polishing.

It appears to applicants that the Examiner is saying that (1) the Nissan polishing composition contains a sol and (2) it does not matter how the sol is formed, whether from an aluminum salt or from a different component, because applicants have not shown that the sols from aluminum salts differ from other sols, and have not shown how the sols from aluminum salts would provide the polishing composition of the present invention with different characteristics.

In addition, it appears that the Examiner is saying that the Nissan polishing composition contains a sol either because the aluminum nitrate polishing accelerator in Nissan forms a sol or because Nissan specifically discloses the use of an aluminum sol at, for example, pages 8 and 14.

In response, as discussed above, Nissan does not disclose the use of an alumina sol in a final polishing composition. Therefore, Nissan cannot obtain the effects of the present invention.

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The sol product of the present invention derived from an aluminum salt is not a boehmite sol, but an amorphous sol. See paragraph [0036] of the present application. The effects of the sol product derived from an aluminum salt are: enhancing the polishing rate synergistically with the polishing accelerator, modifying the viscosity of the entire composition, enhancing dispersibility and re-dispersibility of aluminum particles and enhancing retention of alumina on a polishing pad to reduce the amount of roll-off. See paragraph [0028] of the present application.

The Examiner states, in the last paragraph of page 5 of the Office Action, that Nissan discloses, at page 8, conventional processes that can be used to obtain the alumina hydrate. The Examiner asserts that it is conventional to obtain alumina hydrate from aluminum salts and alkali and/or ammonia base. The Examiner states that the alumina produced from salts has not been shown to be distinct from the alumina disclosed in the Nissan reference.

Applicants point out, however, that the disclosure at page 8 of Nissan relates to the starting sol materials that Nissan employs to produce the alumina powder that is in the final composition, and does not relate to forming a polishing composition that contains a sol.

Applicants emphasize that the claims of the present invention recite a composition that contains both alumina crystals and an alumina sol. The Nissan patent document discloses producing alumina crystals from alumina sol, but Nissan does not disclose the combined use of an alumina sol and alumina crystals.

With respect to the Examiner's statement that it is conventional to obtain alumina hydrate from aluminum salts and alkali and/or ammonia base, applicants point out that although it has



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been known to obtain an aluminum hydrate from a combination of an aluminum salt with alkali and/or ammonium as pointed out by the Examiner, the effects of the present invention cannot be obtained until an alumina sol produced from an aluminum salt is used in combination with alumina crystals for a polishing composition to perform polishing.

In view of the above, applicants submit that the present claims are patentable over Nissan and Erickson and, accordingly request withdrawal of this rejection.

Claims 1-7 and 10-12 have been rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative under 35 U.S.C. §103(a) as obvious over U.S. Patent 5,366,542 to Yamada et al.

The Examiner argues that Yamada et al disclose polishing compositions comprising alumina dispersed in water and in combination with aluminum salts and chelating agent such as aminocarboxylic acid salts and polishing accelerators, and that these components would form a sol. Such a disclosure appears in Example 2 of Yamada et al. See, for example Run Nos. 2-5.

In the Amendment that was filed on October 1, 2003, applicants stated that Yamada et al do not refer to a sol product in Example 2, but only refer to the product as a slurry.

Yamada et al disclose in Example 2 that their composition contains  $\delta$ -alumina, an aluminum salt and a chelate compound such as an aminocarboxylic acid-based chelate compound.

Applicants submit, however, that it is a hasty conclusion to consider that mixing an aminocarboxylic acid-based chelate compound and an aluminum salt can produce the sol product

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of the present invention. Mixing the two merely results in a mixed solution thereof, and does not always produce a sol.

In order to obtain a sol, the two have to be mixed by means of a high-shear stirrer. See, for example, paragraphs [0031], [0032], [0053], and the like, of the present application. Example 2 in Yamada et al does not describe either the high-shear stirring or the sol production. Therefore, it cannot be said that Example 2 of Yamada et al discloses or suggests the polishing composition of the present invention.

Further, the Examiner points out that Yamada et al teach at column 3, lines 19-21, that when Yamada et al employ boehmite, Yamada et al state that the boehmite may be used in the form of a powder or a boehmite sol.

Applicants have previously argued that the boehmite in Example 1 of Yamada et al was not a boehmite sol.

In response, and as discussed above, the sol product of the present invention derived from an aluminum salt is not a boehmite sol, but is an amorphous sol. See paragraph [0036] of the present application. Accordingly, even if a boehmite sol is obtained in Example 1 of Yamada et al, this would not satisfy the recitations of the present claims of an amorphous sol.

The Examiner states in Paragraph 18 of the Office Action that applicants have argued that Yamada et al discloses micron sized particles, and that Yamada et al refer to slurries rather than colloidal sols. The Examiner asserts that the present claims are directed to (a) water, (b) alumina crystal and (c) a sol product, and that none of the claims define any particle size nor do any of

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the claims define the sols as colloidal. The Examiner here is addressing applicants' argument that Example 1 of Yamada et al does not disclose a sol.

In response, as discussed above, even if a sol should be produced in Example 1 of Yamada et al, the sol would be a boehmite sol, not an amorphous sol.

The Examiner in Paragraph 18 of the Office Action states that a number of methods of making alumina sols are known, including those employing a mixture of an aluminum salt with a base and/or chelating agent. In response, although there are a large number of sol-producing methods, not all of the methods can be applied to the present invention. The Examiner has offered no evidence that one of ordinary skill in the art would be led to employing an amorphous sol in the polishing composition of the present invention.

In view of the above, applicants submit that Yamada et al do not disclose or suggest the subject matter of claims 1 to 7 and 10 to 12 and, accordingly, request withdrawal of this rejection.

Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as obvious over WO '089 to Nissan as evidenced by Erikson and further in view of Peterson.

This rejection is substantially similar to the rejection in the previous Office Action, except that the Examiner now refers to column 17, lines 23-39 of Peterson as disclosing dispersion aids, including ammonium hydroxide, aluminum chlorides or basic aluminum nitrates, and columns 15-18 for a disclosure of alumina sols and alumina particle dispersions.

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The Examiner argues that the references are combinable because they teach alumina sols and alumina dispersions, and that it would have been obvious to employ the conventional dispersions aids of Peterson in Nissan to improve dispersion stability.

In Paragraph 19 of the Office Action, the Examiner states that applicants have argued at pages 15 and 16 of the previous Amendment that Peterson fails to supply the deficiencies of Nissan. The Examiner states that “said components are clearly known as conventional additives in making polishing compositions for the advantage of stability”. It is not clear to applicants what components the Examiner is referring to when he refers to “said components”.

The Examiner also states in Paragraph 19 that the present claims are directed to (c) the sol product of (i) or (ii). The Examiner then states that “Applicants have not indicated why the sol products” . This is an incomplete statement by the Examiner, and applicants do not know what the Examiner intended to say at this point.

Claims 8 and 9 depend from claim 1 and, accordingly, applicants submit they are patentable over Nissan for the same reasons as discussed above in connection with the rejection of claim 1 over Nissan.

Claims 8 and 9 recite that the sol product is a mixture of at least one aluminum salt selected from the group consisting of aluminum sulfate, aluminum chloride and aluminum nitrate with at least one compound selected from group consisting of sodium hydroxide, potassium hydroxide, ammonia, triethanolamine and aminotrismethylenephosphonic acid.

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Peterson disclosed various dispersion aids, including basic aluminum salts such as basic aluminum chloride and basic aluminum nitrate, but Peterson does not disclose that these salts should be used in combination with at least one compound selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonia, triethanol-amine and aminotrismethylenephosphonic acid to form an alumina sol.

In addition, the alumina sols that are disclosed in Peterson are boehmite sols that are used to form dried, solid alumina particles (crystals), and are not used to form polishing compositions.

Further, the dispersion aids in Peterson are used in a process to make alumina particle based dispersions which are then processed into dried solid abrasive alumina particles (crystals). Peterson does not disclose the use of the dispersion aids or the boehmite sols to form polishing compositions containing the components (a), (b) and (c). Applicants also point out that the effects peculiar to claims 8 and 9 are to accelerate the polishing speed, greatly reduce the amount of roll-off and obtain a high-quality mirror-finished surface free of pits, projections and scratches. See paragraphs [0028, [0057] and [0058] of the present application.

In view of the above, applicants submit that Nissan, Erickson and Peterson do not disclose or suggest the subject matter of claims 8 or 9 and, accordingly, request withdrawal of this rejection.

Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as obvious over Yamada et al and further in view of Peterson.

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Claims 8 and 9 depend from Claim 1. Accordingly, applicants submit that claims 8 and 9 are patentable over Yamada et al for the same reasons as discussed above in connection with the rejection of claim 1 over Yamada et al.

In addition, applicants rely on the arguments they set forth above with respect to Peterson.

Applicants have also argued that one would not have had any reason to combine Peterson with Yamada et al. The Examiner states they are combinable because they both relate to alumina sols and alumina dispersions.

In response, Yamada et al disclose a polishing agent to obtain a precise surface, such as that of a hard disc, whereas Peterson discloses a coated abrasive exhibiting an enhanced grinding performance capable of cutting several tens of grams of a steel workpiece per minute; that the application of the coated abrasive in Peterson to the hard disc in Yamada et al would result in grinding the disc into nullification; and that the application of the polishing composition of Yamada et al to the steel workpiece in Peterson would result in substantial failure to grind the steel workpiece. Accordingly, applicants maintain that there is no motivation for those skilled in the art to combine Yamada et al and Peterson.

Furthermore, the alumina sol in Peterson is not an amorphous sol, and there is no description in Peterson in respect of the production of a sol in consequence of the preparation of the dispersant.

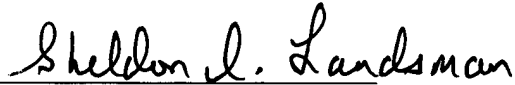
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In view of the above, applicants submit that claims 8 and 9 are patentable over Yamada et al and Peterson and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
Sheldon I. Landsman  
Registration No. 25,430

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: April 16,2004